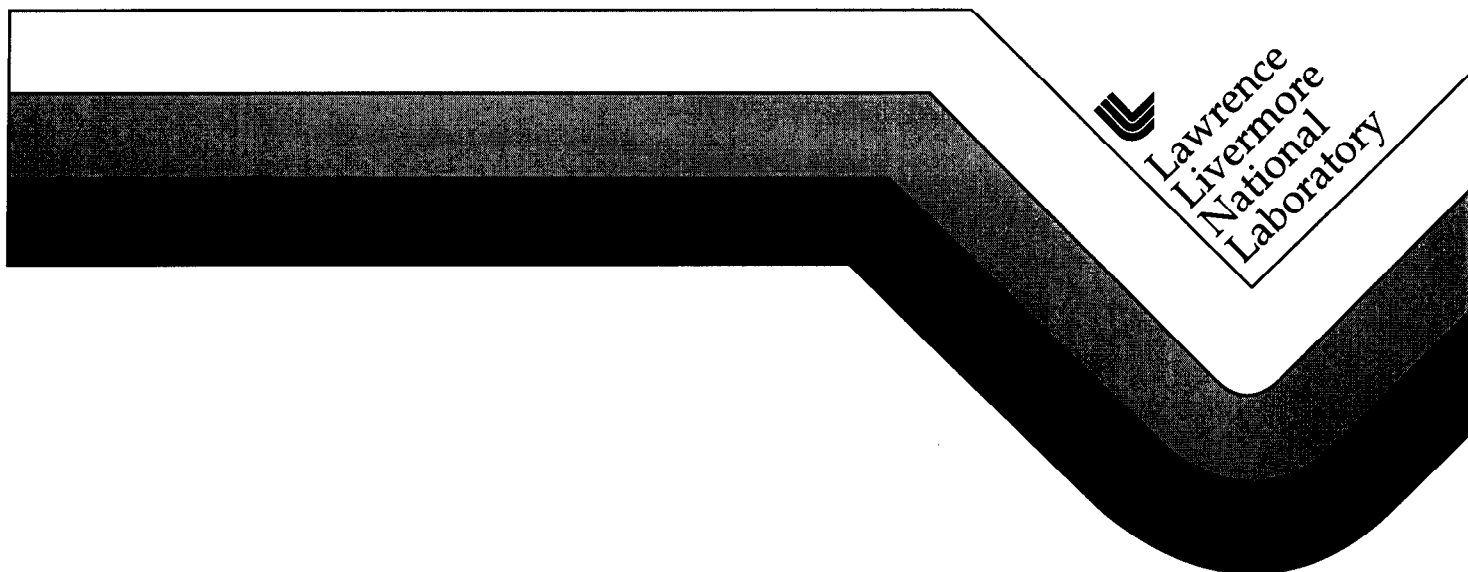


Configuration Management Standard

D. Rex Beach
Phillip Hill

May 1999



DISCLAIMER

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

Lawrence Livermore National Laboratory

Configuration Management Standard

D. Rex Beach
Phillip Hill

May 1999

Contents

Preface	iii
1.0 Introduction.....	1
1.1 Purpose.....	1
1.2 Overview	1
2.0 Reference Standards.....	2
3.0 Applicability.....	2
4.0 Requirements	2
4.1 Program Management.....	2
4.2 Design Requirements.....	3
4.3 Document Control.....	3
4.4 Change Control	3
4.5 Assessments.....	4
4.6 Graded Approach.....	4
5.0 Definitions.....	4

Preface

The Configuration Management Standard is one of several local Lawrence Livermore National Laboratory (LLNL) environmental, safety, and health standards that was prepared during the Work Smart Standards Closure Process to address areas not adequately covered by Department of Energy (DOE) orders or national consensus standards. The original version was approved on March 16, 1999. Questions or comments about this standard should be addressed to the Technical Support and Policy Development Division Industrial Safety Technical Leader in the Hazards Control Department.

Lawrence Livermore National Laboratory
Configuration Management Standard

1.0 Introduction

1.1 Purpose

The purpose of Configuration Management (CM) is to establish consistency among the design requirements, physical configuration, and facility documentation necessary to protect workers, the public, and the environment during the operational life cycle of a facility. The purpose of this standard is to identify the requirements and approaches to implementing CM for LLNL facilities.

1.2 Overview

There are a number of DOE orders that require performance of some elements of CM but there is no single order or requirements document that integrates all of the CM elements into a single program. This standard is intended to ensure the integration of the existing requirements without duplicating or expanding requirements in other orders identified in the University of California's contract to operate LLNL for the DOE.

A successful CM program depends on clearly defining objectives and on performing the following elements:

- Program management
- Design requirements
- Document control
- Change control
- Assessments

Certain additional functions may be needed to establish the CM program but may not be needed for its whole operational life.

The CM elements are implemented using a graded approach. Section 4.6 describes the factors involved in implementing the graded approach.

2.0 Reference Standards

The following is a matrix of the CM elements and applicable reference directives and guidance that are included in LLNL's Work Smart Standards.

	Management	Design Requirements	Document Control	Change Control	Assessments	Configuration Maintenance
DOE Order 5480.23, Section 8.d			X			
DOE Order 420.1, Sections 4.1, 4.2.2, 4.3.2, and 4.4.2		X				
10 Code of Federal Regulations (CFR) 830.120, Criterion 1, 4, 5, 6, and 9	X	X	X		X	
DOE Order 430.1A, Section 6.f.(4)						X
DOE Order 420.2, Contractor Requirements Document, Section a.(6)						X
DOE Order 414.1, Criterion 1, 4, 5, 6, and 9	X	X	X		X	
DOE Order 5480.19	X		X	X		

DOE-STD-1073, *Guide for Operational Configuration Management Program*, provides additional guidance on developing and implementing a CM program. This standard is intended to serve as guidance only and does not impose or contain additional requirements for developing implementation plans for LLNL operations.

3.0 Applicability

This standard applies to all facilities, specifically for the systems, structures, components, and operations needed to protect workers, the public, and the environment during the operational life cycle of the facility.

4.0 Requirements

4.1 Program Management

The overall CM program must be managed, directed, and monitored. LLNL is developing and strengthening its ES&H management process in accordance

with Integrated Safety Management requirements. As part of this management process, the required elements of a CM program must be integrated and documented in LLNL's management system. As a minimum this includes roles and responsibilities, organizational structure, and standard CM terminology.

4.2 Design Requirements

The CM program must establish and maintain the design requirements and associated design basis.

A design baseline must be established at a level commensurate with the hazards of the facility. Baselines are defined by the minimum set of design documentation required to enable the facility, equipment, safety systems and supporting safety systems, and activities to operate within the safety envelope defined in the Safety Analysis Report (SAR) and Facility Safety Plan (FSP).

4.3 Document Control

The CM program must have a document control element to identify and maintain ES&H documentation consistent with the physical configuration, established design requirements, and critical operational and maintenance activities.

A document control and records management system shall be established to identify, track, and control important facility documents needed to protect workers, the public, and the environment.

4.4 Change Control

The change control element of the CM program is used to maintain consistency among the design requirements, the physical configuration, critical operational and maintenance activities, and the facility documentation as changes are made.

Formal processes for controlling changes affecting ES&H protection shall be established and applied to changes to the following:

- Facility safety documents, such as SARs and FSPs, and supporting documents, such as design documentation.
- Hardware, such as systems, structures, and equipment.
- Software such as accident-mitigating control programs.
- Safety procedures.

4.5 Assessments

Assessments are used to help define the facility CM needs and to measure how effective the CM program is in establishing and maintaining the program's basic relationships.

Periodic CM assessments shall be performed to ensure conformance to the requirements in this UCRL.

4.6 Graded Approach

The CM program uses a graded approach to determine the appropriate level of resources that should be applied to the program elements and to apply resources where the greatest benefit can be realized. It is unrealistic to develop a single set of CM criteria directly applicable to all facilities; therefore, a graded approach is used to adapt the requirements in this section. The graded approach is a process by which the level of analysis, documentation, and actions necessary to comply with a requirement are made commensurate with a number of considerations including:

- Relative importance to safety, safeguards, and security.
- Magnitude of any hazard involved.
- Life-cycle stage of a facility.
- Programmatic mission of a facility.
- Particular characteristics of a facility.
- Facility size and complexity.
- Facility lifetime planned and remaining.
- Facility operational status.
- Programmatic and technical issues.
- Facility grade.
- Grades of structures, systems, and components.

5.0 Definitions

Change

Any alteration or addition, temporary or permanent, to the safety-related physical configuration, documentation, or design requirements of the facility. Additions, revisions, and deletions not within current design requirements involve design changes. Identical replacements are not changes.

Change Control	A process that ensures all safety changes are properly identified reviewed, tested, and documented.
Design Basis	Design basis consists of the design inputs, design constraints, design analysis, and calculations used to explain why a design requirement has been specified in a particular manner or as a particular value. It often includes seismic qualification, fire protection, and safe shutdown information and encompasses safety and authorization basis and consideration of facility availability, facility efficiency, costs, and maintainability.
Design Requirement	Engineering specifications reflected in output documents such as drawings and specifications that define functions, capabilities, capacities, physical sizes, dimensions, and set points for a structure system and component. The design requirements provide the results of the design process.
Facility Grade	A measure of the importance of the facility, among other DOE facilities that can be used to determine the appropriate level of effort and resources for the implementation.
Facility Operational Life Cycle	The phases a facility goes through including design, construction, operation, and shutdown/decommissioning. A major renovation or redesign phase is included when the DOE programmatic mission for a facility may shift and significant facility changes are involved.
Physical Configuration	The actual physical location, arrangement, and material condition of structures, systems, and components within a facility.